# GranDSLAM™ 4200
# ATM Stackable DSLAM

## Installation Guide

**Document No. 4200-A2-GN20-10**

October 2002

PARADYNE®

## Notice



## Warranty, Sales, Service, and Training Information

Contact your local sales representative, service representative, or distributor directly for any help needed. For additional information concerning warranty, sales, service, repair, installation, documentation, training, distributor locations, or Paradyne worldwide office locations, use one of the following methods:

- **Internet:** Visit the Paradyne World Wide Web site at **www.paradyne.com**. (Be sure to register your warranty at **www.paradyne.com/warranty**.)
- **Telephone:** Call our automated system to receive current information by fax or to speak with a company representative.
  - — Within the U.S.A., call 1-800-870-2221
  - — Outside the U.S.A., call 1-727-530-2340

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## Trademarks

## ⚠ Important Safety Instructions

1. Read and follow all warning notices and instructions marked on the product or included in the manual.
2. Do not attempt to service this product yourself, as opening or removing covers may expose you to dangerous high voltage points or other risks. Refer all servicing to qualified service personnel.
3. **FUSE WARNING:** If DC input power is connected to the unit, an energy hazard (a potential equal to or greater than 240VA) may exist at the fuse holder. When installing or replacing either of the alarm-indicating fuses, do not contact metal parts of the fuse spring arm, which may be energized, even after the fuse has tripped. Never remove the plastic fuse cap from the fuse; it is there to protect against inadvertent contact with the spring arm. Refer all fuse installation/replacement to qualified service personnel who have been trained on this equipment.

   **CAUTION:** FOR CONTINUED PROTECTION AGAINST RISK OF FIRE, REPLACE ONLY WITH THE SAME TYPE AND RATING OF FUSE. Use a fuse that is rated for a maximum 60 VDC, 3.5A (Model 4210) or 4A (Models 4220/4230).

   **ATTENTION:** Pour ne pas compromettre la protection contre les risques d'incendie, remplacer par un fusible de même type et de mêmes caractéristiques nominales.
4. This product is to be installed only in a Restricted Access Location (dedicated equipment rooms, equipment closets or the like) in accordance with articles 110-16, 110-17 and 110-18 of the National Electrical Code, ANSI/NFPA 70.
5. This product is to be connected to a 48 VDC SELV supply source that is electrically isolated from the ac source. The positive terminal of the 48 VDC source is to be reliably connected to earth. Connect a green/yellow earthing (grounding) wire to the protective earthing (grounding) lug connector, identified by the protective earth symbol on the chassis.
6. A readily accessible disconnect device as part of the building installation shall be incorporated in fixed wiring. The disconnect device (a 48 VDC, 20A, single pole circuit breaker or switch) must be included in the ungrounded supply conductor. Over current protection must be included with a 20A, 48 VDC fuse or circuit breaker in the ungrounded conductor. Use minimum 18 AWG fixed power source wires with strain retention.
7. Input power to the ALARM relay interface (located on the front panel of the enclosure) must not exceed 30V rms or 60 VDC.
8. Do not allow anything to rest on the power cord and do not locate the product where persons will walk on the power cord.
9. Slots and openings in the cabinet are provided for ventilation. To ensure reliable operation of the product and to protect it from overheating, these slots and openings must not be blocked or covered.
10. General purpose cables are described for use with this product. Special cables, which may be required by the regulatory inspection authority for the installation site, are the responsibility of the customer. To reduce the risk of fire, use a UL Listed or CSA Certified, minimum No. 26 AWG (0.128 $mm^2$) telecommunication cable, or comparable cables certified for use in the country of installation.
11. A rare phenomenon can create a voltage potential between the earth grounds of two or more buildings. If products installed in separate buildings are **interconnected**, the voltage potential may cause a hazardous condition. Consult a qualified electrical consultant to determine whether or not this phenomenon exists and, if necessary, implement corrective action prior to interconnecting the products.
12. In addition, if the equipment is to be used with telecommunications circuits, take the following precautions:
    - — Never install telephone wiring during a lightning storm.
    - — Never install telephone jacks in wet locations unless the jack is specifically designed for wet locations.
    - — Never touch uninsulated telephone wires or terminals unless the telephone line has been disconnected at the network interface.
    - — Use caution when installing or modifying telephone lines.
    - — Avoid using a telephone (other than a cordless type) during an electrical storm. There may be a remote risk of electric shock from lightning.
    - — Do not use the telephone to report a gas leak in the vicinity of the leak.

13. The equipment is intended for installation in a max. 65° C ambient temperature, in an environment that is free of dust and dirt.
14. When installed in the final configuration, the product must comply with the applicable Safety Standards and regulatory requirements of the country in which it is installed. If necessary, consult with the appropriate regulatory agencies and inspection authorities to ensure compliance.
15. Do not physically stack more than five (5) 42xx units high. Physical stability has not been evaluated for stacking higher than five units, and any configuration greater than five may result in an unstable (tip-over) condition. Ensure that the four (4) rubber feet supplied with the product have been installed on the bottom of each unit prior to stacking any 42xx units on top of one another.
16. If the equipment has an internal POTS splitter, then to be compliant with the Bellcore NEBS requirements GR-1089-CORE, sections 4.2.2 (Current Limiting Protectors) and 4.5.11 (Current Limiting Protector Tests), current limiting protectors shall be used on the DSL lines entering the facility.

## EMI Notices

### ⚠ UNITED STATES – EMI NOTICE:

**This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.**

**The authority to operate this equipment is conditioned by the requirements that no modifications will be made to the equipment unless the changes or modifications are expressly approved by Paradyne Corporation.**

**If the equipment includes a ferrite choke or chokes, they must be installed per the installation instructions.**

### ⚠ CANADA – EMI NOTICE:

**This Class A digital apparatus meets all requirements of the Canadian interference-causing equipment regulations.**

**Cet appareil numérique de la classe A respecte toutes les exigences du réglement sur le matérial brouilleur du Canada.**

## Notices to Users of the Canadian Telephone Network

**NOTICE:** This equipment meets the applicable Industry Canada Terminal Equipment Technical Specifications. This is confirmed by the registration number. The abbreviation IC before the registration number signifies that registration was performed based on a Declaration of Conformity indicating that Industry Canada technical specifications were met. It does not imply that Industry Canada approved the equipment.

**NOTICE:** The Ringer Equivalence Number (REN) for this terminal equipment is labeled on the equipment and includes the effect of the POTS splitter. The REN assigned to each terminal equipment provides an indication of the maximum number of terminals allowed to be connected to a telephone interface. The termination on an interface may consist of any combination of devices subject only to the requirement that the sum of the Ringer Equivalence Numbers of all the devices does not exceed five.

## CE Marking

When the product is marked with the CE mark on the equipment label, a supporting Declaration of Conformity may be downloaded from the Paradyne World Wide Web site at **www.paradyne.com**. Select *Library* → *Technical Manuals* → *CE Declarations of Conformity.*

## Japan

Class A ITE

この装置は、情報処理装置等電波障害自主規制協議会（ＶＣＣＩ）の基準に基づくクラスＡ情報技術装置です。この装置を家庭環境で使用すると電波妨害を引き起こすことがあります。この場合には使用者が適切な対策を講ずるよう要求されることがあります。

This is a Class A product based on the standard of the Voluntary Control Council for interference by Information Technology Equipment (VCCI). If this equipment is used in a domestic environment, radio disturbance may arise. When such trouble occurs, the user may be required to take corrective actions.

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## 2 Cabling

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# A Connectors and Pin Assignments



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# About This Guide

## Document Purpose and Intended Audience

This document is written for technicians who install the GranDSLAM 4200 ATM Stackable DSLAM.

## New Features for This Release

This version of the document supports GranDSLAM Release 2.0 and adds the following information:

- Model 4220 ADSL unit (Annex A)
- Model 4230 ADSL unit (Annex B)
- Model 4203 T1/E1 IMA Uplink
- New brackets for 23-inch EIA, Nortel, and Bay Networks racks.

# Document Summary

| Section | Description |
|---|---|
| Chapter 1, *Installation* | Describes the physical installation of the GranDSLAM 4200 into a rack. |
| Chapter 2, *Cabling* | Describes how to install all cables for the GranDSLAM 4200 and the uplink modules. |
| Chapter 3, *LEDs* | Explains the meaning and usage of the front panel LEDs. |
| Chapter 4, *Configuration* | Describes the minimal configuration steps required to prepare the GranDSLAM 4200 for remote access. |
| Appendix A, *Connectors and Pin Assignments* | Provides pinouts for all connectors on the GranDSLAM 4200 and the uplink modules. |
| Appendix B, *Equipment List* | Provides part numbers for the GranDSLAM 4200 and related products. |
| Appendix C, *Technical Specifications* | Lists the technical characteristics of the GranDSLAM 4200. |
| *Index* | Lists key terms, acronyms, concepts, and sections in alphabetical order. |

A master glossary of terms and acronyms used in Paradyne documents is available on the World Wide Web at **www.paradyne.com**. Select *Library* → *Technical Manuals* → *Technical Glossary.*

# Related Product Documents

Documentation for the GranDSLAM 4200 is available on the World Wide Web at **www.paradyne.com**. Select *Library* → *Technical Manuals.*

| Document Number | Document Title |
|---|---|
| 4200-A2-GB20 | *GranDSLAM 4200 ATM Stackable DSLAM User's Guide* |
| 4200-A2-GN10 | *GranDSLAM 4200 ATM Stackable DSLAM Uplink Module Installation Instructions* |
| 6390-A2-GK40 | *Hotwire ReachDSL Modem, Model 6390 with Inline Phone Filter, Installation and Operation Supplement* |
| 6390-A2-GN10 | *Hotwire ReachDSL Modem, Model 6390 with Inline Phone Filter, Installation Instructions* |
| EMS-A2-GB21 | *GrandVIEW EMS 3.0 User's Guide* |

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- Outside the U.S.A., call 1-727-530-8623

# Installation

# 1

## Overview

The GranDSLAM™ 4200 is a family of stackable DSLAMs designed for installation in the Central Office (CO) environment or in a standalone configuration for small deployments. It is available with or without internal POTS splitters.

The ReachDSL™ Model 4210 is interoperable with the Hotwire® 6390 ReachDSL modem, as well as with all Customer Premisies Equipment (CPE) containing Asymmetric Digital Subscriber Line/ReachDSL (ADSL/R™) chipsets.

The ADSL Model 4220 is interoperable with any ADSL CPE.

A user interface is provided via a Transaction Language No. 1 (TL1) Command Line Interface (CLI) or the unit may be managed using a network management system such as the Paradyne GrandVIEW™ Element Management System (EMS).

Up to five GranDSLAM 4200 units can be stacked, with the Inverse Multiplexing for Asynchronous Transfer Mode (IMA) uplink supporting one IMA uplink group and aggregating up to 120 ports of DSL traffic. A single Permanent Virtual Circuit (PVC) is used to manage the entire stack. Both ReachDSL and ADSL units can be included in the same stack.

GranDSLAM 4200 models and features are listed in Table 1-1, GranDSLAM 4200 Models and Features.

**Table 1-1. GranDSLAM 4200 Models and Features**

| Model Number | Type | Number of Ports | Annex A/Annex B |
|---|---|---|---|
| 4210 | ReachDSL | 24 | N/A |
| 4220 | ADSL | 24 | Annex A |
| 4230 | ADSL | 24 | Annex B |

# Preparation

Consider the following before installing the GranDSLAM 4200:

- **Installation Site**

  Your installation site should be well ventilated, clean, and free of environmental extremes.

- **Installation Options**

  The GranDSLAM 4200 may be:

  — Mounted with the included mounting brackets in a standard 19-inch (483 mm) or 23-inch (584 mm) rack (including both Bay Networks and Nortel 23-inch racks), or, with separately purchased mounting brackets, in a 21-inch (535 mm) ETSI rack. ETSI brackets are available from Paradyne. See Appendix B, *Equipment List*.

  As many GranDSLAM 4200 units may be mounted in a standard rack as there are 1.75-inch (44.45 mm) spaces in the rack, so long as adequate cooling is provided.

  — Mounted vertically against a wall.

  The standard mounting brackets provided can be fastened to the base of the unit for wall mounting.

  — Set on a shelf or desktop.

  Up to five GranDSLAM 4200 units may be stacked on a shelf or desktop. Different models can be mixed in a stack.

- **Uplink Modules**

  Various uplink modules are available and one must be installed in each GranDSLAM 4200. Any uplink module can be installed in any GranDSLAM model. Your unit may have arrived from the factory with one of the following uplink modules already installed:

  — 4201 T1 Uplink Module

  — 4202 E1 Uplink Module

  — 4203 8-port T1/E1 IMA Uplink Module

- **Power**

  The GranDSLAM 4200 operates from a –48 VDC power supply (–40.5 to –57.0 VDC) to allow for standard power connections available in a CO. For AC voltage environments, an external AC-to-DC power converter is required.

- **Other Cabling**

  No cables are provided with the GranDSLAM 4200. See Table 1-2, Cable Descriptions, to determine what cables you need to procure before installation.

# Cables Required

Table 1-2 shows all the cables that may be required for your installation.

**Table 1-2. Cable Descriptions**

| Connector Name | Connector and Cable | For Connecting . . . |
|---|---|---|
| DSL PORTS 1–24<br><br>POTS 1–24 | 50-pin RJ21X Telco-type straight connector and 50-wire cable. Two cables required, one for DSL and one for POTS (if used). | Up to 24 DSL ports to Main Distribution Frame, punchdown block, or splitters.<br><br>Up to 24 POTS splitter ports to Main Distribution Frame or punchdown block. |
| 4201 T1 MODULE:<br><br>100Ω | RJ48C | A downstream GranDSLAM 4200 to an upstream ATM network. |
| 4202 E1 MODULE:<br><br>■ TX/RX 75Ω<br><br>■ 120Ω | <br><br>■ BNC<br><br>■ RJ48C | A downstream GranDSLAM 4200 to an upstream ATM network. |
| 4203 T1/E1 IMA MODULE | RJ48C | ■ A downstream GranDSLAM 4200 to an upstream ATM network.<br><br>■ A GranDSLAM 4200 aggregation unit to a basic unit in a stack. |
| MGMT | 8-position modular plug and 8-wire Category 5 or better unshielded twisted pair (UTP) cable. | The GranDSLAM 4200 to a Network Management System over a Local Area Network (LAN) employing 10BaseT or 100BaseT. |
| CONSOLE | DB9 plug connector and shielded cable.<br><br>■ The other connector depends on the serial port on your terminal or PC, but normally is a DB9 socket.<br><br>■ The other connector depends on the serial port on your modem, but normally is a DB25 plug. | The GranDSLAM 4200 to one of the following:<br><br>■ A terminal or a PC with a terminal emulation program, or<br><br>■ A modem. |
| 4210 ALARM | 3-position terminal block and 3-wire shielded, twisted-pair cable. | The GranDSLAM 4200 to an alarm system. |
| 4220/4230 ALARM | 5-position terminal block and 5-wire shielded, twisted pair cable. | The GranDSLAM 4200 to an alarm system. |
| BITS (Building Integrated Timing Supply) | Not applicable. | For future use. |

# Unpacking the Hardware

**HANDLING PRECAUTIONS FOR STATIC-SENSITIVE DEVICES**

**This product is designed to protect sensitive components from damage due to electrostatic discharge (ESD) during normal operation. When performing installation procedures, however, take proper static control precautions to prevent damage to equipment. If you are not sure of the proper static control precautions, contact your nearest sales or service representative.**

The GranDSLAM 4200 is shipped in a cardboard shipping container. Carefully remove the unit from its shipping container and check for physical damage. If the unit shows signs of shipping damage, notify your sales representative.

# Package Contents

In addition to this installation guide, the GranDSLAM 4200 shipping carton should contain:

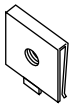
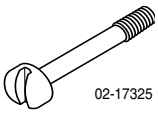
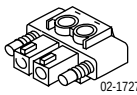
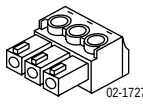
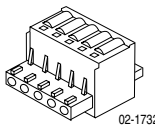
- GranDSLAM 4200
- Two sets of mounting brackets, one set suitable for a 19-inch (483 mm) rack and one set suitable for a 23-inch (584 mm) rack (including Bay Networks and Nortel)
- Hardware kit (see Table 1-3, Contents of Hardware Kit Shipped with the GranDSLAM 4200)

If anything is missing, notify your sales representative.

Before installing the GranDSLAM 4200, read the *Important Safety Instructions* in the beginning of this document.

Be sure to register your warranty at **www.paradyne.com/warranty**.

**Table 1-3. Contents of Hardware Kit Shipped with the GranDSLAM 4200**

| Appearance | Description | Quantity |
|---|---|---|
|  02-17259 | Flat-head screw for attaching 19" mounting brackets to unit | 7 |
|  02-17326 | Machine screw with captive starwasher (6-32 x 1/4″) for attaching 23" mounting brackets to unit | 7 |
|  02-17256 | Self-retaining nut for racks without threaded holes | 5 |
|  02-17257 | Dress screw (12-24 x 1/2″) for use with self-retaining nuts | 5 |
|  02-17258 | Machine screw with captive starwasher (10-32 x 1/2″) for use with racks with threaded holes | 5 |
|  02-17325 | Captive pan-head screw for replacing long Telco screw | 3 |
|  02-17261 | Rubber foot for desk-mount and stacking of units | 4 |
|  02-17262 | Cable tie (8″) for strain relief and cable management | 3 |
|  02-17272 | 2-position plug with screw flange for power connection | 2 |
|  02-17273 | 3-position plug for ALARM connection on Model 4210 | 2 |
|  02-17327 | 5-position plug for ALARM connection on Model 4220 and Model 4230 | 2 |

# Mounting Configurations

Three basic installation configurations are available:

- Rack mount – see *Installing the Brackets for Rack Mounting* on page 1-6 and *Installing the GranDSLAM 4200 Into a Rack* on page 1-8.
- Wall mount – see *Installing the GranDSLAM 4200 on a Wall* on page 1-10.
- Shelf or desktop – see *Installing the GranDSLAM 4200 on a Shelf or Desktop* on page 1-12.

# Mounting Brackets

Your GranDSLAM 4200 can be installed in a rack or on the wall using mounting brackets. Two brackets suitable for a 19-inch (483 mm) rack (marked EIA-19) and two brackets suitable for a 23-inch (584 mm) Bay Networks or Nortel rack (marked with Paradyne Part Number 868-6282-0020) are shipped with the unit. Two brackets suitable for a 21-inch (535 mm) rack (marked ETSI) are available from Paradyne as a separate feature (see Appendix B, *Equipment List*).

Rack-mounting brackets may also be used to attach the unit to a wall.

**NOTE:**

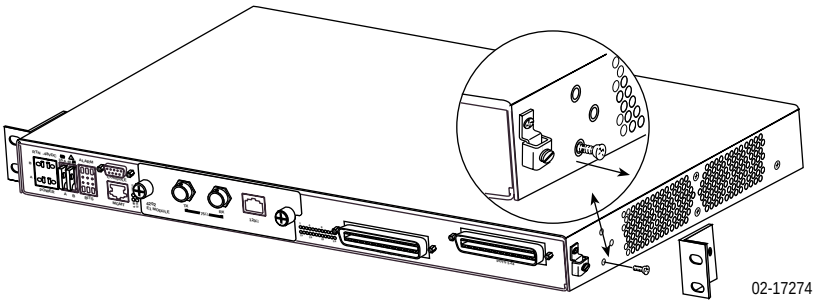
In this guide, the term *rack* refers to any rack, cabinet, frame, or bay suitable for mounting telecommunications equipment.

# Installing the Brackets for Rack Mounting

**▶ Procedure**

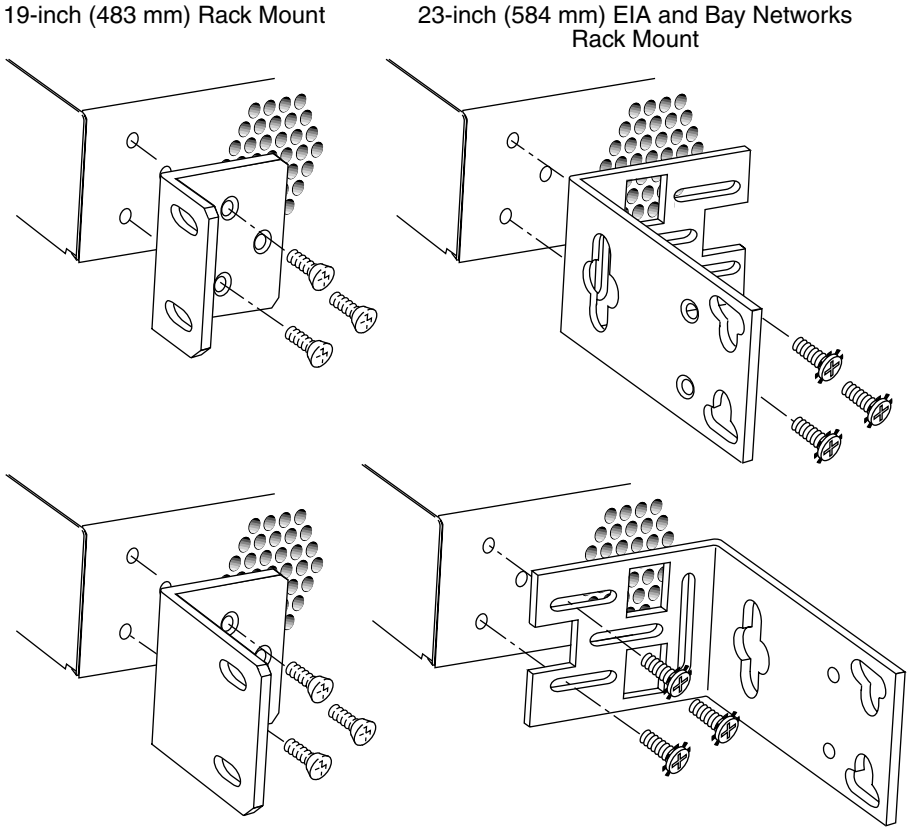
To install the mounting brackets for rack mounting:

1. Locate the black screw nearest the front panel on each side of the unit as shown.




2. Remove these two black screws (one from each side) before attempting to install the mounting brackets.

3. Identify six flat-head screws (for 19-inch racks) or six machine screws (for 23-inch racks) provided with the mounting brackets in the hardware kit.
4. Attach the brackets appropriate to your rack size. Tighten all screws firmly.



# Installing the GranDSLAM 4200 Into a Rack

Two types of mounting screws are provided. Use:

- #10-32 mounting screws for rails with threaded screw holes
- #12-24 mounting screws and self-retaining nuts for rails with unthreaded screw holes

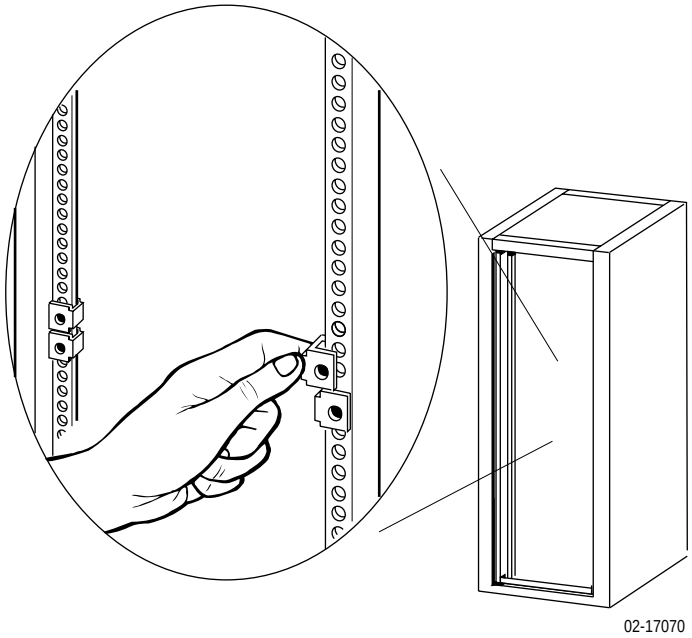
**NOTE:**

Before installing the GranDSLAM 4200 in a rack or cabinet, you may prefer to first attach the unit to a ground while you have unrestricted access to the grounding lug on the side of the unit. See *Grounding Lug* in Chapter 2, *Cabling* for more information.

## ▶ Procedure

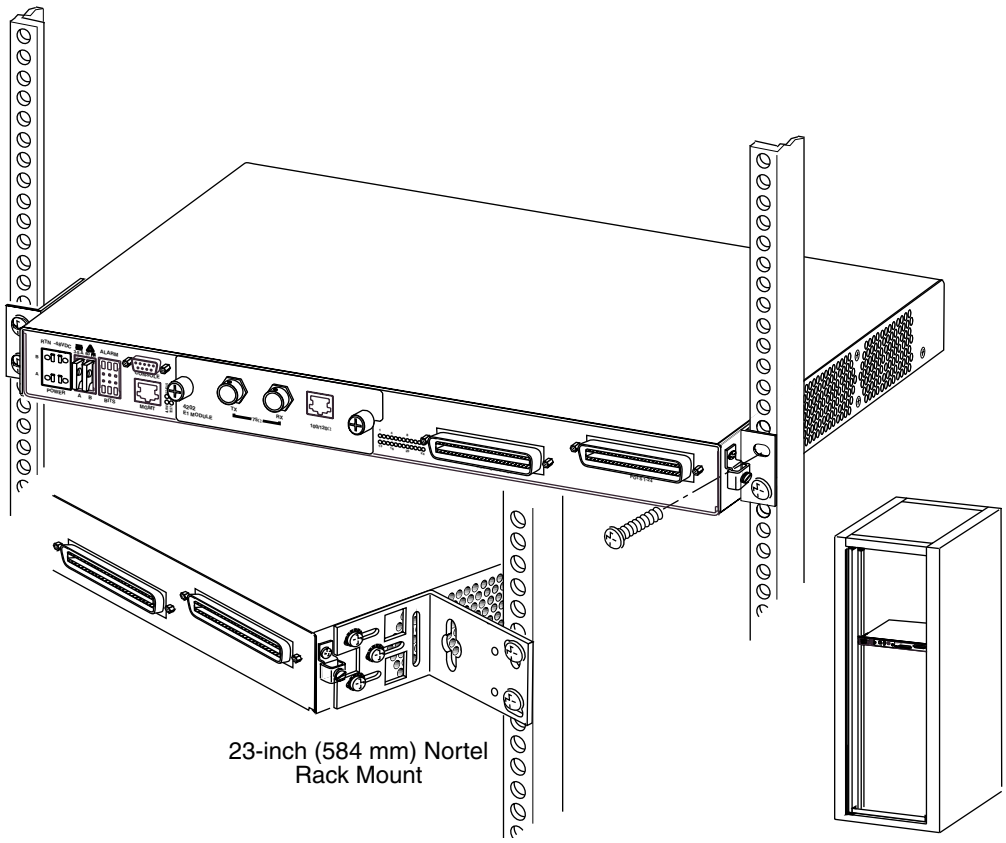
To install the GranDSLAM 4200 into a rack:

1. Determine where in the rack you will mount the GranDSLAM 4200. If your rack does not have threaded screw holes, slip self-retaining nuts onto the rails where the GranDSLAM 4200 will be fastened.




2. Place the unit so that the brackets rest against the front of the rails. Insert screws in the bottom screw positions and hand-tighten them.

3. Insert and tighten the screws in the top screw positions, then tighten the bottom screws.




4. Do not plug in the unit. Proceed to *Installing the Uplink Module* on page 1-13.

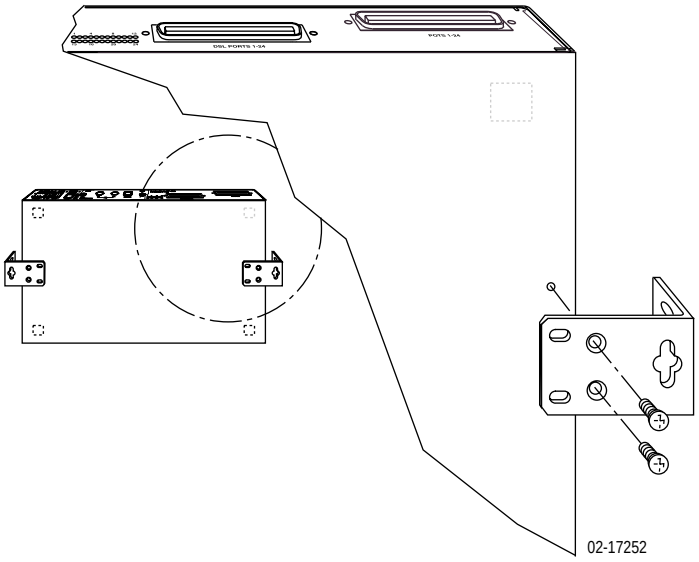
# Installing the GranDSLAM 4200 on a Wall

Wall mounting requires two wood screws suitable for the weight of the fully cabled unit. These are not included. Use at a minimum 1/4-inch (6 mm) diameter screws in 3/4-inch (19 mm) plywood (not drywall).

## ▶ Procedure

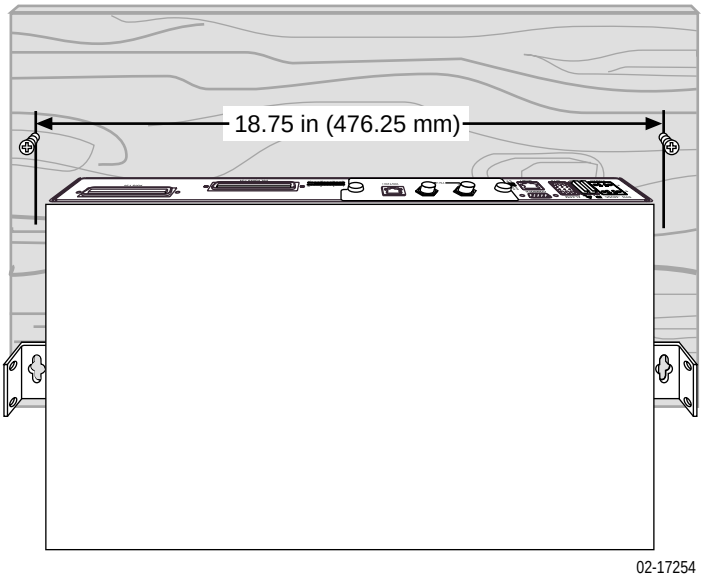
To install the GranDSLAM 4200 on a wall:

1. Identify the flat-head screws provided in the hardware kit and the brackets suitable for a 19-inch rack. Two screws are required for each bracket.
2. Orient the unit so that the bottom is facing you and the faceplate is at the top.
3. Locate the supplied Right Side mounting bracket and fasten it to the right side of the unit.




4. Locate the supplied Left Side mounting bracket and fasten it to the left side of the unit.
5. Tighten all screws firmly.

6. Install two wood screws (not provided) at the same height above the floor and 18.75 inches (476.25 mm) apart. Do not completely tighten the screws. Leave them so their heads are about 1/4 inch (6 mm) from the wall.




7. Hang the unit from the wood screws to verify that the screws are properly placed. The screws should freely slide into the top of the key slots in the brackets.

8. Do not fasten the unit to the wall until after it is completely cabled and tested. Proceed to *Installing the Uplink Module* on page 1-13.

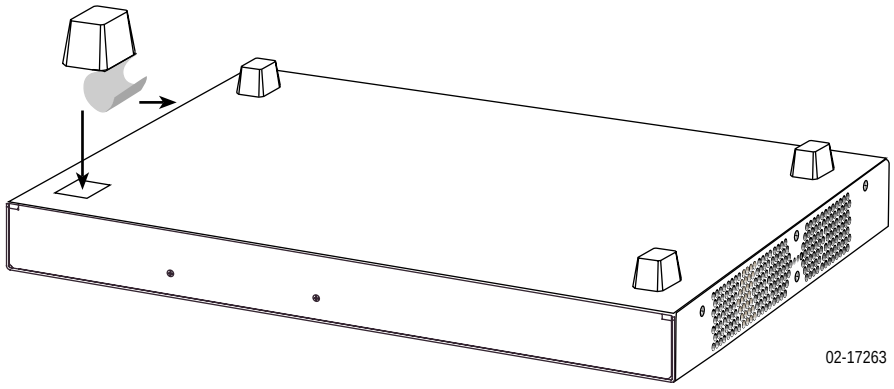
# Installing the GranDSLAM 4200 on a Shelf or Desktop

If the GranDSLAM 4200 will be placed on a shelf or desktop, install the provided rubber feet before putting the unit in position.

## ▶ Procedure

To install the GranDSLAM 4200 on a shelf or desktop, as a standalone unit or in a stack:

1. Locate the rubber feet in the hardware kit provided with the unit.
2. Turn the unit upside down on a work surface. Squares stamped into the bottom of the unit show the proper positions for the feet.
3. Remove the protective sheet from the bottom of each foot, then press the foot onto a corner of the bottom of the unit.




4. Turn the unit right side up and place it in position on a shelf or desktop.

   If the installation includes more than one unit, one can be stacked atop another. Up to five units can be stacked together. If you intend to aggregate the stack into a single uplink using the Model 4203 T1/E1 IMA Uplink Module, the aggregation unit can be placed anywhere within the stack.

5. Do not plug in the unit. Proceed to *Installing the Uplink Module* on page 1-13.

# Installing the Uplink Module

Each GranDSLAM 4200 requires an uplink module for connection to the ATM network. If your uplink module was shipped separately from the GranDSLAM 4200, install the uplink module before you connect the unit to a power source. If your GranDSLAM 4200 arrived with an uplink module already installed, proceed to Chapter 2, *Cabling*.

**NOTE:**

The uplink modules are hot swappable. If you install an uplink module after the unit has already been powered-on, reset the unit before attempting to operate it.

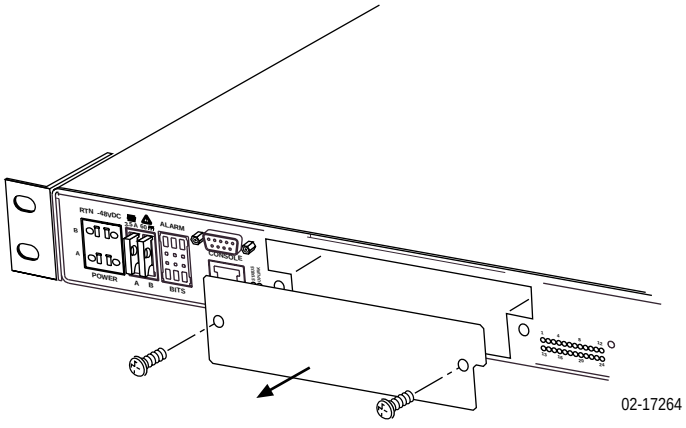
### ⚠ HANDLING PRECAUTIONS FOR STATIC-SENSITIVE DEVICES

**This product is designed to protect sensitive components from damage due to electrostatic discharge (ESD) during normal operation. When performing installation procedures, however, take proper static control precautions to prevent damage to equipment. If you are not sure of the proper static control precautions, contact your nearest sales or service representative.**

### ▶ Procedure

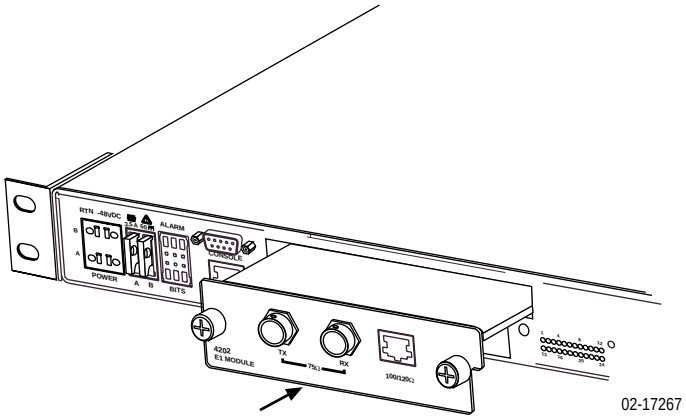
To install the uplink module:

1. Remove the two captive screws holding the blank filler panel on the GranDSLAM 4200.




2. Store the blank filler panel and screws for possible future use.

3. Slide the uplink module into the guide rails just inside the opening. Press the uplink module firmly into place until it is fully seated and the faceplate of the uplink module is flush against the faceplate of the GranDSLAM 4200.




4. Fasten the two screws provided with the uplink module.

Do not plug in the unit. Proceed to Chapter 2, *Cabling*.

# Cabling

# 2

## Cabling Overview

The GranDSLAM 4200 has a large variety of possible cabling configurations. This chapter describes all possible connections, not all of which are required:

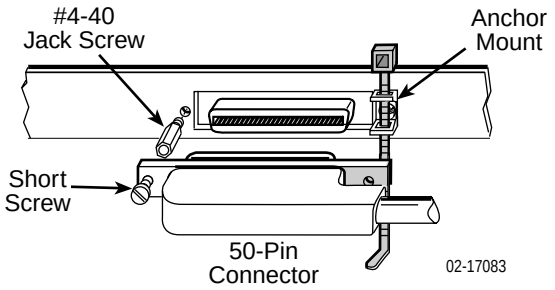
# DSL Ports

The GranDSLAM 4200 DSL connector supports the tip and ring connections of up to 24 DSL ports over a 50-position cable. A POTS (plain old telephone service) splitter connector is also provided. If your model does not contain the integrated POTS splitter, you must connect the unit to a separate POTS splitter.

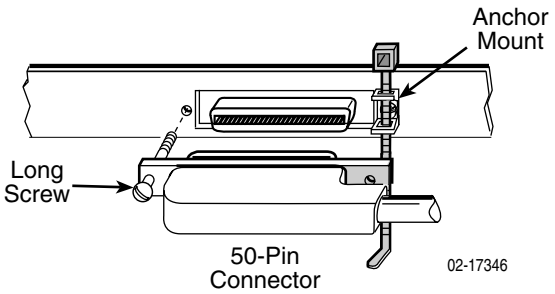
## ▶ Procedure

To cable the DSL Ports:

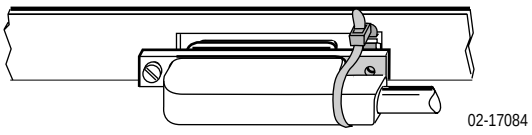
1. Insert a cable tie (provided) through the top of the anchor mount next to the DSL PORTS 1–24 connector.
2. If the connector for your cable has a short captive screw, attach the cable to the DSL PORTS 1–24 connector and fasten it to the jack screw with its short captive screw.




3. If the connector for your cable has a long captive screw, remove the provided jack screw from the threaded hole next to the DSL PORTS 1–24 connector. Attach the DSL PORTS 1–24 connector to the unit using the long, captive pan-head screw (provided).




4. Tighten the cable tie around the connector and trim the excess.




5. If using an integrated POTS splitter, the POTS 1–24 connector is used. Repeat Step 1 through Step 4, substituting POTS 1–24 for DSL PORTS 1–24.
6. Secure the cables as required for strain relief.

# Uplink Module Connectors

The following types of uplink modules are available for the unit:

- Model 4201 T1 Uplink Module
- Model 4202 E1 Uplink Module
- Model 4203 T1/E1 IMA Uplink Module

## 4201 T1 Uplink Module Connector

The 4201 T1 Uplink Module has a single RJ48C, 8-pin, unkeyed, shielded connector.

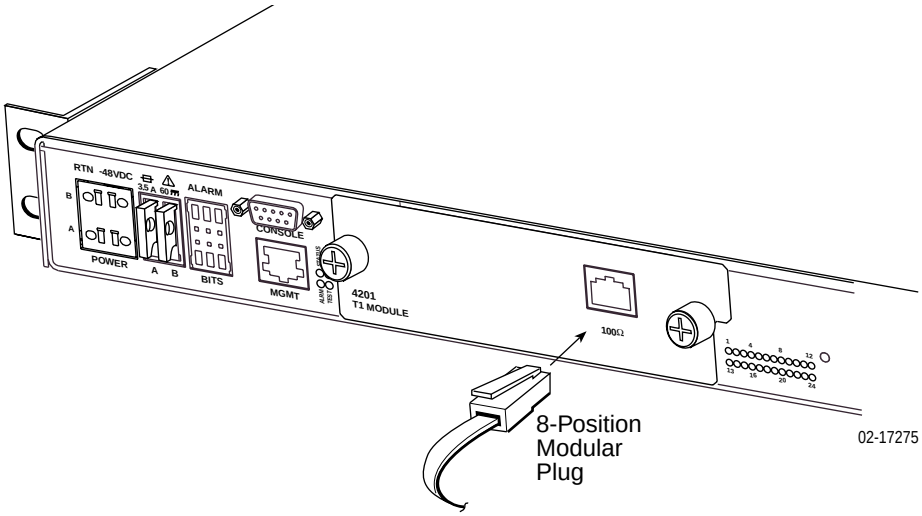
**NOTE:**

The metal shell of the T1 connector is grounded. Pins 7 and 8 of the connector are not grounded. Therefore, if the cable you are using is wired to ground the cable shield to pins 7 and 8, you must first obtain a cable with a shielded plug and connect the cable shields (drain wires) to the plug's shield. If your cable has separate shields for transmit and receive, you must ground both drain wires. You can also ground the shields at the far end, or you can use a nonshielded cable.

### ▶ Procedure

To connect to the 4201 T1 Uplink Module:

1. Determine the interface type, and procure the appropriate cable.
2. Plug the 8-position modular plug into the 100Ω modular jack.




3. Connect the other end of the cable to the appropriate network equipment such as a multiplexer.

## 4202 E1 Uplink Module Connectors

The 4202 E1 Uplink Module has two connectors, only one of which may be used at a time:

- 120Ω connector – A balanced RJ48C, 8-pin, unkeyed, unshielded connector. The 120Ω connector is the default.
- 75Ω connector – An unbalanced BNC connector with two jacks (TX/RX). To use the 75Ω connector, you must change the default using the TL1 commands. For more information on TL1 commands, see the *GranDSLAM 4200 ATM Stackable DSLAM User's Guide*.

### NOTE:

The metal shell of the T1 connector is grounded. Pins 7 and 8 of the connector are not grounded. Therefore, if the cable you are using is wired to connect its shield to pins 7 and 8, then the cable's shield will not be grounded at the module end. To ground the cable shield at the module end, you must use a cable with a shielded plug and the cable shields (drain wires) must be connected to the plug's shield. If your cable has separate shields for transmit and receive, you must ground both drain wires. You can also ground the shields at the far end, or you can use a nonshielded cable.

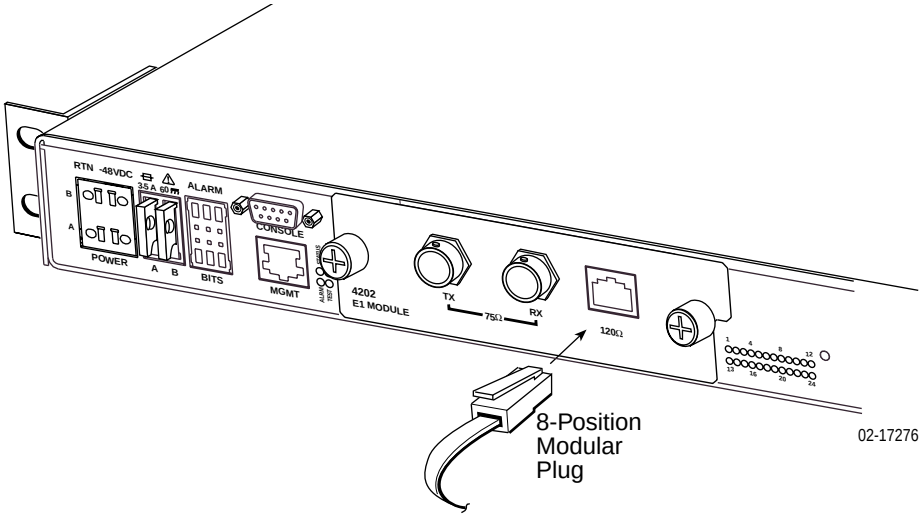
### ▶ Procedure

To connect to the 4202 E1 Uplink Module 120Ω connector:

1. Determine the interface type, and procure the appropriate cable.
2. Plug the 8-position modular plug into the 120Ω modular jack.

### CAUTION:

**Do not plug cables into both the 120Ω and the 75Ω connectors at the same time.**



3. Connect the other end of the cable to the appropriate network equipment such as a multiplexer.

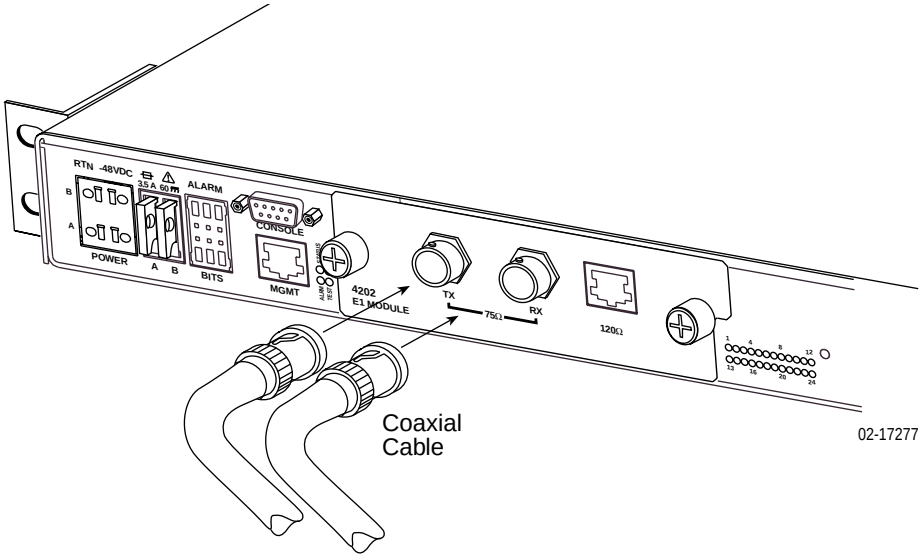
### ▶ Procedure

To connect to the 4202 E1 Uplink Module 75Ω connector:

1. Determine the interface type, and procure the appropriate coaxial cable.
2. Change the connector default to 75Ω using the **ENT-T1** or **ED-T1** TL1 command (**`LINETYPE=G703SHORT75`**).
3. Plug the TX coaxial cable into the TX 75Ω jack.
4. Plug the RX coaxial cable into the TX 75Ω jack.

**CAUTION:**

**Do not plug cables into both the 120Ω and the 75Ω connectors at the same time.**




5. Connect the other end of the cables to the appropriate network equipment such as a multiplexer.

## 4203 T1/E1 IMA Uplink Module Port Connectors

The 4203 T1/E1 IMA Uplink Module supports eight operational T1/E1 ports, each with an RJ48C, 8-pin, unkeyed, shielded connector. The 4203 uplink module can be used to aggregate up to four other GranDSLAM 4200 units subtended in a stack, allowing up to 120 ports in the stack to be managed with a single Permanent Virtual Circuit (PVC).

### NOTE:

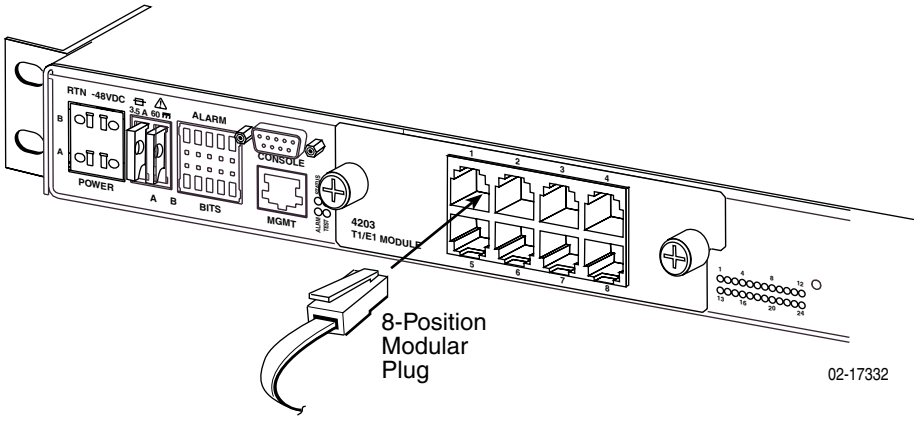
The metal shell of the T1/E1 connector is grounded. Pins 7 and 8 of the connector are not grounded. Therefore, if the cable you are using is wired to ground the cable shield to pins 7 and 8, you must first obtain a cable with a shielded plug and connect the cable shields (drain wires) to the plug's shield. If your cable has separate shields for transmit and receive, you must ground both drain wires. You can also ground the shields at the far end, or you can use a nonshielded cable.

### ▶ Procedure

To connect to the 4203 T1/E1 IMA Uplink Module:

1. Determine the interface type, and procure the appropriate cable.
2. Plug up to eight 8-position modular plugs into the ports labeled **1**–**8**.

   If this is the aggregation unit in a stack, the unit defaults to using ports 1–4 as the uplink ports. This default can be changed using the **ENT-VCL** TL1 command. See the *GranDSLAM 4200 ATM Stackable DSLAM User's Guide* for more information on subtending and TL1 commands.




3. Install the required ferrite choke on all the DSL cables connected to the 4203 T1/E1 IMA Uplink Module (see *Installing the 4203 T1/E1 IMA Uplink DSL Cable Ferrite Choke* on page 2-8).

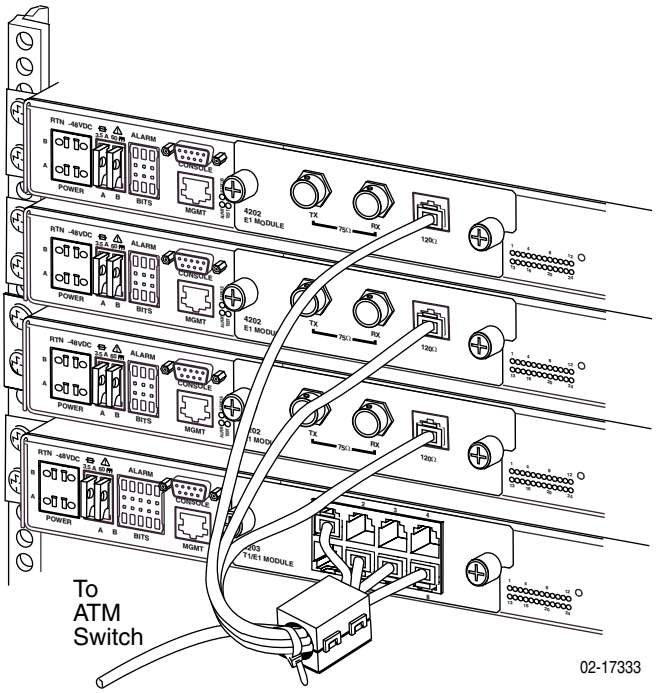
4. Connect the other end of the cable(s) to the appropriate network equipment such as an ATM switch.

   Or, if this is the aggregation unit in a stack, connect to one of the following connectors on a basic unit in the stack:

   — 100Ω connector on a 4201 T1 Module

   — 120Ω connector on a 4202 E1 Module

   — 100Ω/120Ω connector 5–8 on a 4203 T1/E1 IMA Module.



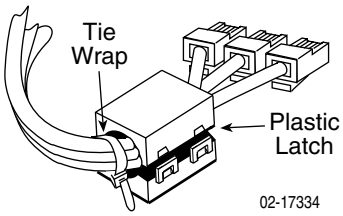
## Installing the 4203 T1/E1 IMA Uplink DSL Cable Ferrite Choke

The 4203 T1/E1 IMA Uplink is shipped with a ferrite choke that must be installed on the DSL cable(s). One choke can accommodate 1–8 cables.

### ▶ Procedure

To install the ferrite choke onto the DSL cable(s):

1. Open the ferrite choke and place it around the cable(s) as close to the cable connector on the uplink module as possible.
2. Close the two halves around the cable and snap the choke shut, pressing down on the plastic latch to secure it.
3. To prevent the ferrite choke from slipping down the cable, install a tie wrap behind the ferrite choke as shown.



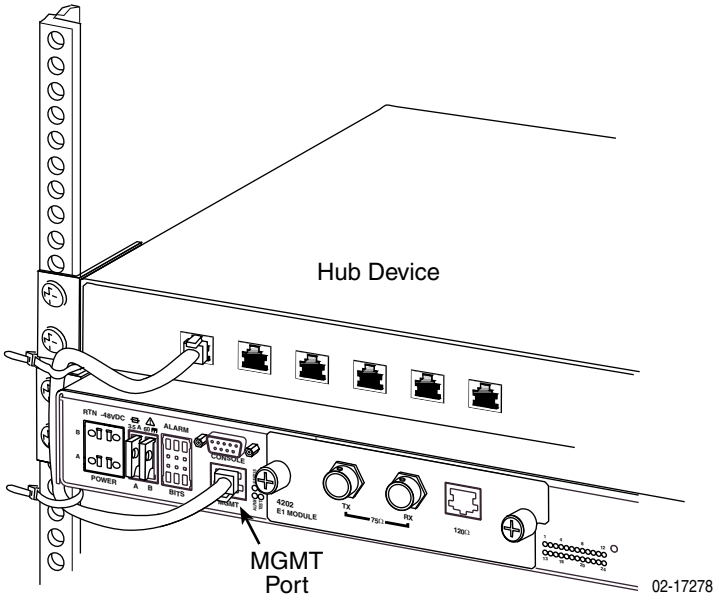
# Management Port

The MGMT (management) port can be used to connect the GranDSLAM 4200 to a network management system using a 10BaseT or 100BaseT LAN. The MGMT port is isolated and no user data is accessible over it. A straight-through cable is used.

### ▶ Procedure

To use the MGMT port:

1. Connect a modular 8-pin cable to the MGMT port.
2. If the GranDSLAM 4200 is in a rack, fasten the cable to a rail with a cable tie.
3. Connect the other end of the cable to your Ethernet hub or to a network interface card in a PC.



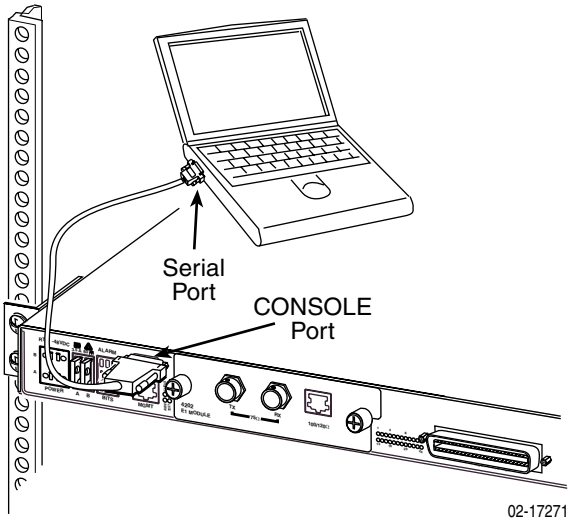
# Console Port

The CONSOLE port normally serves as the primary user interface with the GranDSLAM 4200 during installation. You can connect a terminal or PC directly to the CONSOLE port using a DTE cable (see procedure below). You can also use the CONSOLE port to attach a modem to the GranDSLAM 4200 for remote dial-in management of the unit using a DCE cable (see procedure on next page).

### ▶ Procedure

To connect a terminal or PC to the CONSOLE port:

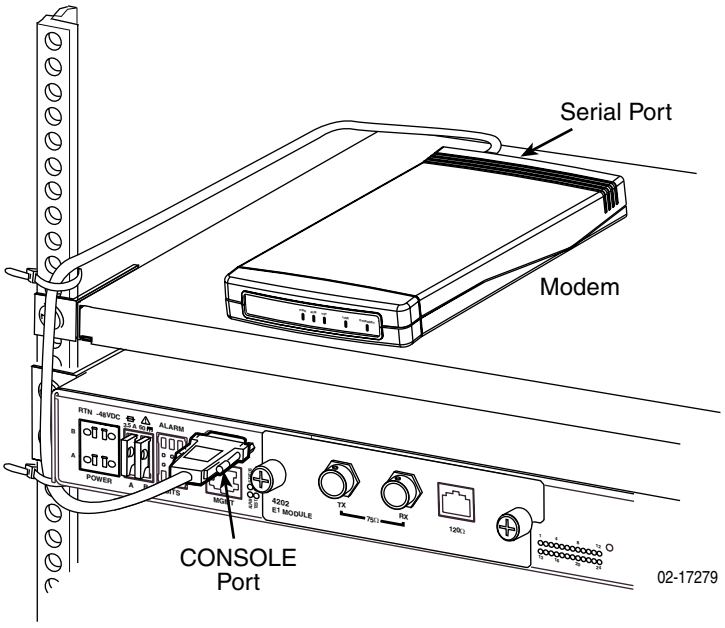
1. Configure the terminal or terminal emulation program to use the following parameters:
   - — Maximum speed: 9600 bps
   - — Data bits: 8
   - — Parity: None
   - — Flow Control: None
   - — Stop bits: 1
2. Determine and procure the proper Data Terminal Equipment (DTE) cable type. The CONSOLE port requires a DB9 plug connector. The other connector depends on the serial port on your terminal or PC.
3. Connect the DB9 plug connector to the CONSOLE port socket. The CONSOLE port is ordinarily used only during installation, so do not fasten the connector.
4. Connect the other end of the cable to the serial port of your terminal or PC.



### ▶ Procedure

To connect a modem to the CONSOLE port:

1. Determine and procure the proper DCE cable type. The CONSOLE port requires a DB9 plug connector. The other connector depends on the serial port on your modem, but normally a DB25 plug is required.
2. Connect the DB9 plug connector to the CONSOLE port socket.
3. If the modem will be permanently connected, fasten the connector to the Management Module with its captive screws. If the GranDSLAM 4200 is in a rack, dress the cable to the left and attach it to the rail with a cable tie.
4. Connect the other end of the cable to the serial port of your modem.



# Alarm Interface

The alarm interface differs, depending on GranDSLAM 4200 model.

- Model 4210 – The ALARM interface for the Model 4210 consists of three contacts that provide access to to the alarm relays that can be used to set off Major and Minor physical alarms. A 3-position plug provided in the Model 4210 hardware kit is used to connect 16–28 AWG wire to the ALARM terminal block (see Table 1-3, Contents of Hardware Kit Shipped with the GranDSLAM 4200, in Chapter 1, *Installation*).
- Models 4220 and 4230 – The ALARM interface for the Models 4220 and 4230 consists of five contacts. Three of the contacts provide access to alarm relays that that can be used to set off Major and Minor physical alarms. The other two contacts provide access to a sense circuit that can be used to detect the open or closed condition of an external alarm relay. See Figure 2-1, Alarm Connection Example, for an example of how to connect a Model 4220 to a Model 4210 so that the Model 4220 can monitor the state (open/closed) of the Model 4210's major alarm.

  A 5-position plug provided in the Model 4220 and Model 4230 hardware kit is used to connect 20–28 AWG wire to the ALARM terminal block (see Table 1-3, Contents of Hardware Kit Shipped with the GranDSLAM 4200, in Chapter 1, *Installation*).

  **CAUTION:**

  The ALARM Sense + and Sense – contacts are intended to be connected to an external alarm relay. Do not apply power to these contacts; doing so will result in damage to the unit.

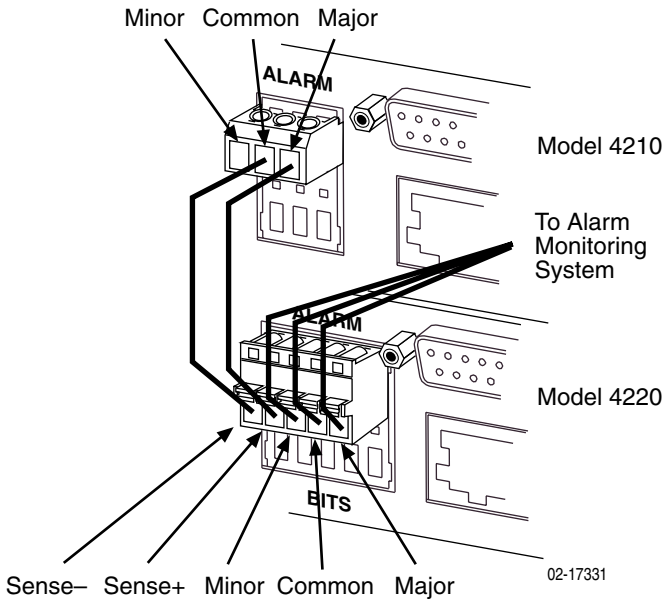



**Figure 2-1. Alarm Connection Example**

### ▶ Procedure

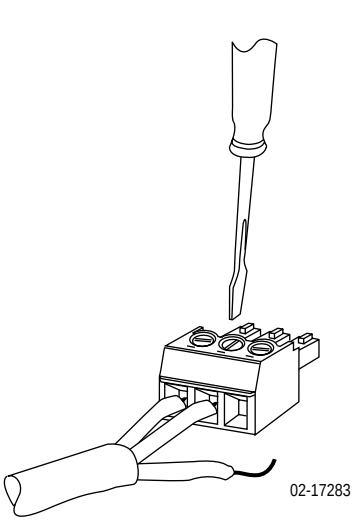
To connect the ALARM interface:

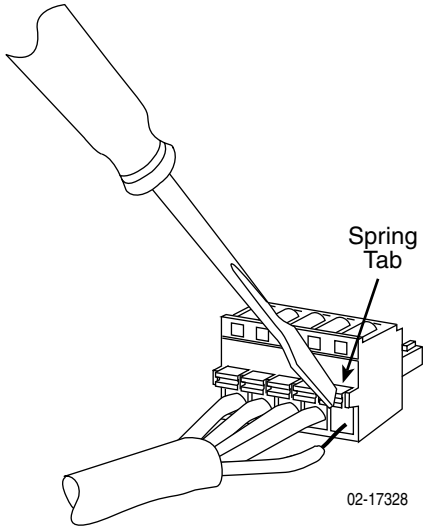
1. Strip the tips of the alarm source wires (about 1/2 inch or 12.7 mm in length).
2. For Model 4210, insert the wires into the 3-position plug. Securely fasten each wire by tightening the screw above it.

   For Models 4220/4230, use a screwdriver to press the orange spring tab in while inserting the wire into the hole below it.

   **NOTE:**

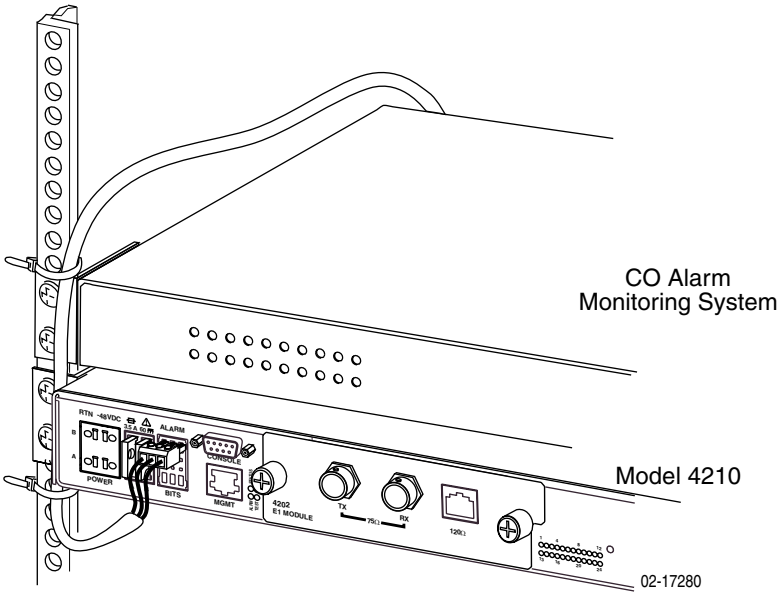
   For all models, the insulation should be fully within the plug and no bare wire should be exposed outside of the plug.



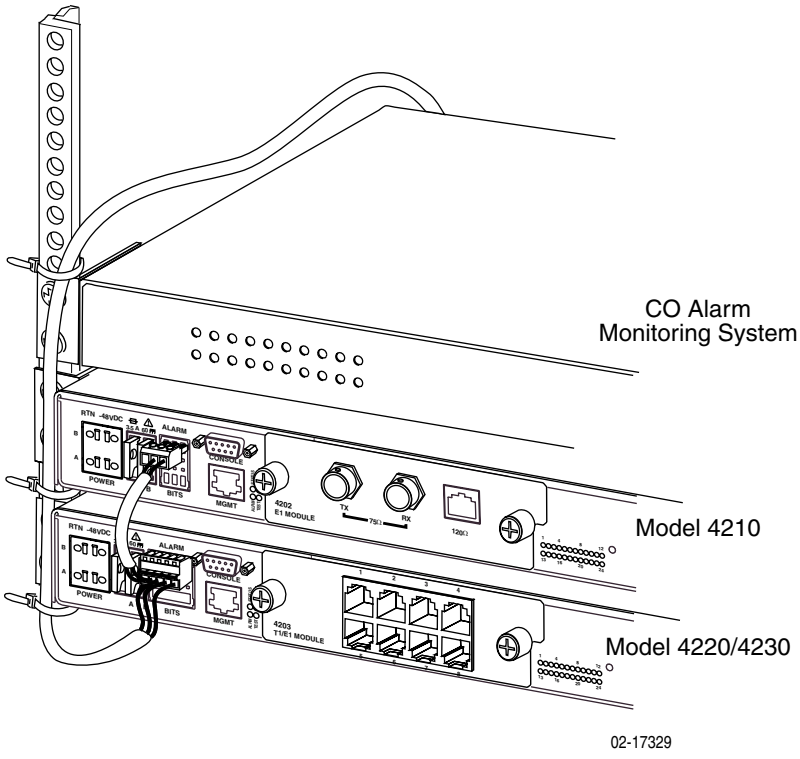




3. Insert the plug into the ALARM interface on the front panel of the GranDSLAM 4200.
4. If the GranDSLAM 4200 is in a rack, dress the cable to the left and secure it to the rail with a cable tie.

5. Connect the other end of the cable to your alarm monitoring system.




Or, for Models 4220 and 4230, you can connect the other end of the cable to an alarm interface on another GranDSLAM 4200 unit so that alarm conditions on both units can be reported through one GranDSLAM 4200.

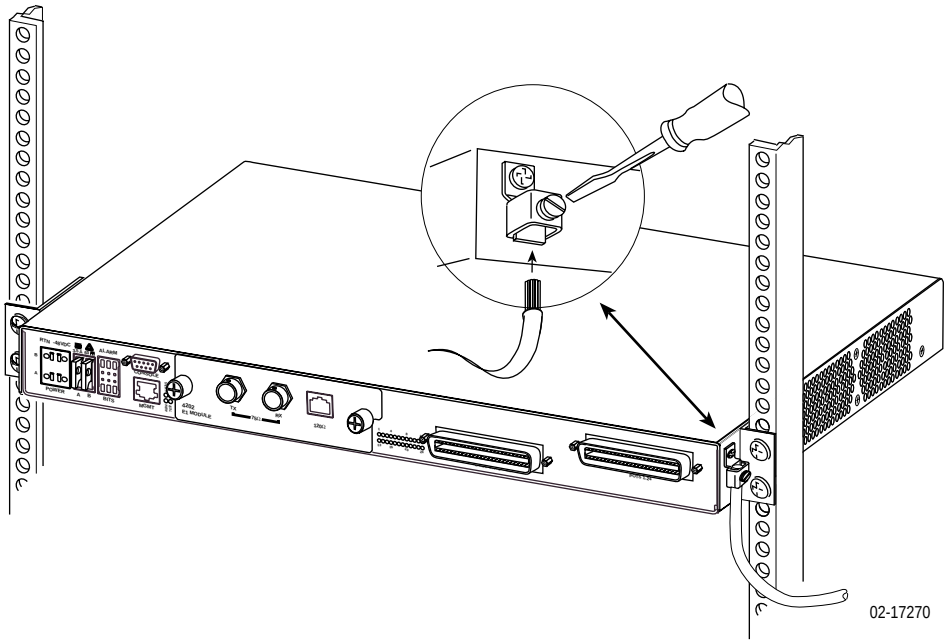


# Grounding Lug

### ▶ Procedure

To connect the unit to a ground:

1. Strip back the insulation approximately 5/16 of an inch (8 mm) on 14 AWG copper ground wire.
2. Loosen the screw on the grounding lug located on the side panel near the front of the unit.
3. Insert the stripped end of the wire through the bottom of the grounding lug and tighten the screw. Ensure that the screw makes contact with the stripped portion of the wire.
4. Attach the ground wire to an earth ground.



# Power Connector

The GranDSLAM 4200 is powered by a –48 VDC source providing –40.5 to –57.0 VDC. Dual power feeds are provided (A and B) for redundancy. The terminal block accepts 16 or 18 AWG wire.

The 4200 GranDSLAM contains two external fuses, each with a visual spring indicator and an alarm circuit indicator in case the fuse is blown.

### CAUTION:

**Make sure that the DC power source wires are not powered (that is, the circuit breakers or fuses are open at the source).**

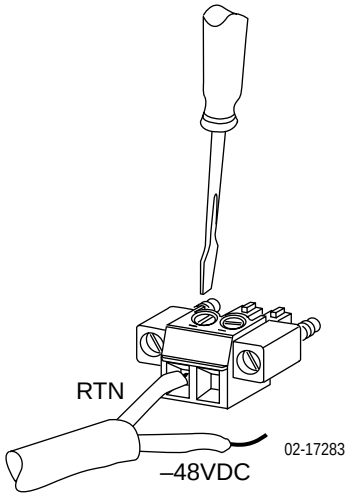
### ▶ Procedure

To supply –48 VDC power to the GranDSLAM 4200 from a single –48 VDC power source:

1. Strip the tips of the power source wires (about 1/2 inch or 12.7 mm in length) before inserting the wire into the 2-position plug.
2. Insert the wires into the supplied 2-position plug with screw flange and securely fasten each wire by tightening the screw above it. The insulation should be fully within the plug and no bare wire should be exposed outside of the plug.

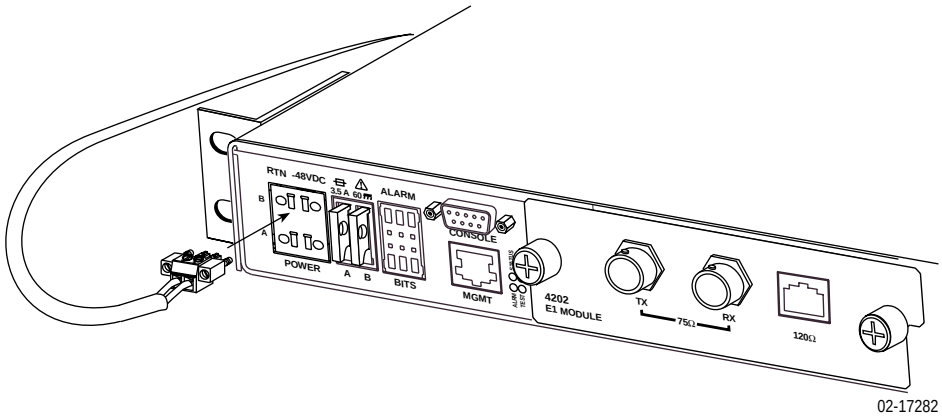
### NOTE:

You should clearly label these power source wires as –48V and RTN respectively.



3. Insert the plug into either the A or B power input terminal on the front panel of the GranDSLAM 4200.

| **Insert the . . .** | **Into the . . .** |
|---|---|
| Negative side of the power source | –**48VDC** input terminal. |
| Positive side of the power source | **RTN** (return) terminal. |



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4. If the unit is in a rack, dress the power cables to the left and fasten them to the rail with a cable tie.
5. Power on the GranDSLAM 4200.
6. Make sure the STATUS LED on the front panel is ON (green). See Chapter 3, *LEDs*.

# LEDs

# 3

## LED Locations

The locations of the System and DSL Port LEDs on the front panel of the GranDSLAM 4200 are shown in Figure 3-1, Front Panel LEDs.

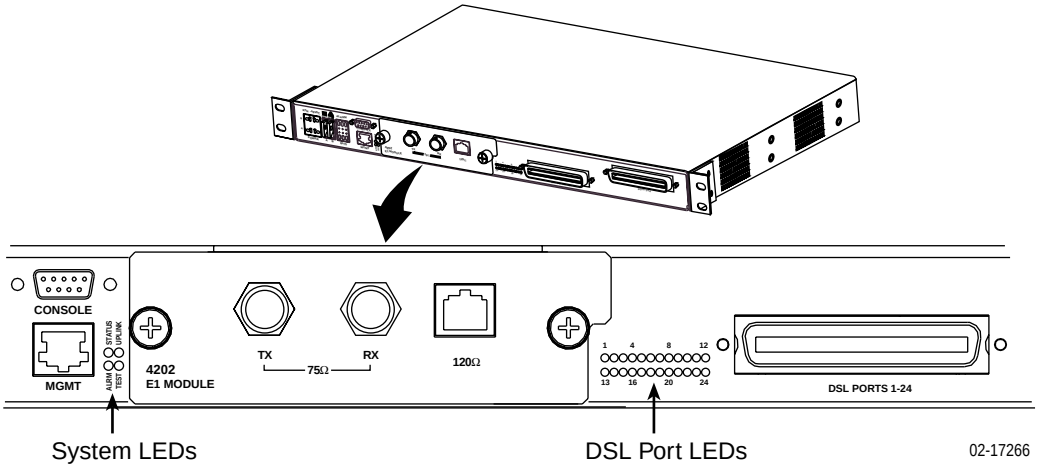



**Figure 3-1. Front Panel LEDs**

# LED Meanings

When power is first applied to the unit, it performs a power-on self-test. When this test is successfully completed, the Status LED blinks. The meaning of all the LEDs is shown in Table 3-1, Front Panel LEDs.

**Table 3-1. Front Panel LEDs**

| LED | Color | State | Meaning |
|---|---|---|---|
| ALARM | Amber | Off | No Alarms. |
| | | On | At least one major or critical alarm has been detected. |
| | | Blinking | At least one minor or automatic message alarm has been detected. No major or critical alarms have been detected. |
| DSL Port (1–24) | Green | Off | The port is disabled or no signal is detected on the line. |
| | | On | The port has successfully trained with the remote and is active. |
| | | Blinking | The port is attempting to train. |
| STATUS | Green | Off | No power. |
| | | On | The unit has power and has completed initialization and the self-test. |
| | | Blinking | Normal operation. |
| TEST | Amber | Off | Normal operating mode. No disruptive tests are active in the system. |
| | | On | At least one disruptive test is active in the system. |
| UPLINK[1] | Green | Off | The link is disabled, or no physical connection exists. |
| | | On | The link is up. |
| | | Blinking | An ATM alarm is occuring on the uplink. |

[1] For an IMA group connection, the UPLINK LED goes off when that group connection is down. However, if any link in the group goes down, the UPLINK LED blinks.

# Configuration

# 4

## Overview

The GranDSLAM 4200 is designed to require minimal configuration before it can be accessed by a Network Operations Center (NOC).

Initial configuration can be performed using the Command Line Interface (CLI). The CLI is available from a terminal or PC connected to the CONSOLE port.

Additional configuration may be necessary, depending on the mode used to manage the GranDSLAM 4200:

- Inband management (managing via a PVC from the NOC).
- Managing out of band through the Ethernet port.

Additional configuration is also necessary if you do not choose to accept the defaults that have been automatically assigned to your GranDSLAM 4200. For more configuration information, see the *GranDSLAM 4200 ATM Stackable DSLAM User's Guide*.

### Conventions Used

In this book, the Enter key means whatever key you use to submit data to your terminal or PC. It may be called the Return key on older devices.

Characters displayed on your screen, including those you type, are shown in the **`Courier`** font in this book.

## Using the CLI

The GranDSLAM 4200 uses Transaction Language No. 1 (TL1) language for CLI commands and messages. These commands and messages are used to configure and maintain the system. See the *GranDSLAM 4200 ATM Stackable DSLAM User's Guide* for detailed information about the CLI.

TL1 offers the following features to help you with command entry:

- **Automatic command completion.** You need to type only enough of a command to make it unique, then type a question mark (?) and the CLI then completes the command.

  For example, if you enter:

  **RTRV-H**

  the CLI expands it to:

  **RTRV-HDR:[TID]::[CTAG];**

- **Automatic completion of optional fields.** Pressing the Tab key while entering a command causes the CLI to fill in the optional fields.

  For example, enter:

  **RTRV-HDR**

  Press the Tab key, the CLI fills in the TID:

  **RTRV-HDR:TL1-Agent**

  Press the Tab key twice again, the CLI fills in the delimiters:

  **RTRV-HDR:TL1-Agent::**

  Press the Tab key again, the CLI fills in the CTAG:

  **RTRV-HDR:TL1-Agent::100**

  Keep pressing the Tab key to fill in the rest of the command delimiters:

  **RTRV-HDR:TL1-Agent::100::;**

- **Command listing.** If you begin typing a command, then press the Tab key, the CLI cycles through all the commands that contain the characters you have just typed.

  For example, enter:

  **RTRV-PROFILE**

  Press the Tab key, the CLI displays:

  **RTRV-PROFILE-ADSLALM**

  Press the Tab key again, the CLI displays:

  **RTRV-PROFILE-ADSLDNALM**

  Press the Tab key again, the CLI displays:

  **RTRV-PROFILE-ADSLDN**

- **Command query.** You can obtain help with CLI commands by typing a **?** (question mark). A question mark alone lists all commands.

  For example, if you enter:

  **RTRV ?**

  the CLI lists all the possible RTRV commands.

- **Command history.** Pressing the Up Arrow key while entering a command returns the CLI to the previous command entry.

- **RTRV-META command.** Retrieves all commands.

# GranDSLAM 4200 Turn-up Procedure

You can turn up your GranDSLAM 4200 through the Ethernet connection via a PC or terminal connected to the unit's CONSOLE port. Then, using a series of TL1 commands or an NMS system such as Paradyne's GrandVIEW Element Management System (EMS), you configure the unit for operation.

The turn-up procedure for the GranDSLAM 4200 system differs, depending on the type of management used:

- Inband Management – Operates over the ATM interface. This is the default for the GranDSLAM 4200.
- Out-of-Band Management – Operates over the Ethernet interface.

The turn-up procedure for both management types also differs, depending on whether you are in Manual mode (no DHCP server), or in DHCP (BOOTP) mode using a DHCP server.

- Manual Mode – If a DHCP server is not being used, you must manually assign an IP address to your GranDSLAM 4200.
- DHCP Mode – If you are using a DHCP server, you do not need manually assign an IP address since this is done automatically.

## Turn-up Procedure for Inband Management

### ▶ Procedure

To turn up the GranDSLAM 4200 using inband management:

1. *Manual Mode:* At the unit, configure the IP address, net mask, and next-hop router.

   *DHCP Mode:* Set the ATM1 physical address using the **ENT-VCL** TL1 command, or accept the default, which is based on the MAC address assigned to the unit.

   Later, when determining what IP address has been assigned via DHCP, look for the MAC address in the DHCP server table. The assigned address is normally the address of the Ethernet port with 0101 appended (the ATM physical address).

2. At the NOC, build a PVC through the network to the unit using VPI/VCI 0,32 and 1483 routed encapsulation. Then, configure routers, etc., as necessary to route data from the NOC to the GranDSLAM 4200.

3. Enable security for your GranDSLAM 4200 unit. Using the TL1 command **ENT-USER-SECU**, change the default login and password. Use the EMS to configure SNMP community strings, the SYSLOG server, and trap managers.

4. Change the time, if necessary. The Simple Network Time Protocol (SNTP), which maintains the unit's clock, defaults to enabled. However, you can change the time offset from Coordinated Universal Time (UTC) using the TZOFFSET parameter of the **SET-NE-ALL** TL1 command. See the *GranDSLAM 4200 ATM Stackable DSLAM User's Guide* for more information.

## Turn-up Procedure for Out-of-Band Management

In out-of-band management, you are managing the unit using the Ethernet interface through the Console port.

### ▶ Procedure

To turn up the GranDSLAM 4200 using the Ethernet interface:

1. At the unit, enable the Ethernet port.

2. *Manual Mode:* Assign an IP address, netmask, and next-hop router.

   *DHCP Mode:* Configure the DHCP server out of the Ethernet port.

3. Configure routers, etc., as necessary to route data from the NOC to the GranDSLAM 4200.

4. Reset the DHCP server and the SNTP since they default to managing from the ATM interface (inband management).

5. Enable security for your GranDSLAM 4200 unit. Using the TL1 command **ENT-USER-SECU**, change the default login and password. Use the EMS to configure SNMP community strings, the SYSLOG server, and trap managers.

6. Change the time, if necessary. The Simple Network Time Protocol (SNTP), which maintains the unit's clock, defaults to enabled. However, you can change the time offset from Coordinated Universal Time (UTC) using the TZOFFSET parameter of the **SET-NE-ALL** TL1 command. See the *GranDSLAM 4200 ATM Stackable DSLAM User's Guide* for more information.

## Configuring the Unit for Operation

Once the unit is connected to the network, the following turn-up procedures should be performed:

- Change the login and password using the **ED-USER-SECU** TL1 command from the defaults SUPERUSER, ASN#1500.
- Change the SNMP community strings using the EMS.

Optionally, you may also choose to do the following using the EMS:

- Configure the syslog server at the NOC.
- Configure the trap managers.

# Connectors and Pin Assignments

# A

## Overview

The following sections provide pin assignments for:



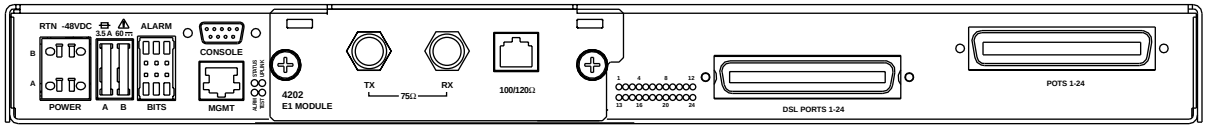



**Figure A-1. GranDSLAM 4200 Front Panel (Model 4210 with 4202 E1 Uplink Module)**

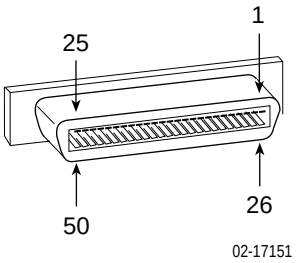
# DSL Ports and POTS Splitter Connectors

The 50-pin RJ21X Telco connector labeled DSL Ports 1–24 provides the 2-wire loop interface from each DSL port to the demarcation point. (The Canadian designation for this connector is CA21A.) The connector is labeled POTS 1–24.

Table A-1 lists the pin assignments for each of these interfaces. Note that Pins 25 and 50 are not used.

**Table A-1. DSL Connector Pinouts**

| DSL Port | Connector Pins (Ring, Tip) |
|---|---|
| 1 | 1, 26 |
| 2 | 2, 27 |
| 3 | 3, 28 |
| 4 | 4, 29 |
| 5 | 5, 30 |
| 6 | 6, 31 |
| 7 | 7, 32 |
| 8 | 8, 33 |
| 9 | 9, 34 |
| 10 | 10, 35 |
| 11 | 11, 36 |
| 12 | 12, 37 |
| 13 | 13, 38 |
| 14 | 14, 39 |
| 15 | 15, 40 |
| 16 | 16, 41 |
| 17 | 17, 42 |
| 18 | 18, 43 |
| 19 | 19, 44 |
| 20 | 20, 45 |
| 21 | 21, 46 |
| 22 | 22, 47 |
| 23 | 23, 48 |
| 24 | 24, 49 |

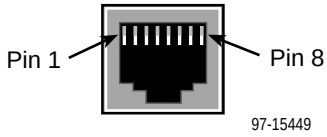


# Management Port Connector

The Management (MGMT) connector is an 8-pin unkeyed modular jack for a 10/100BaseT management interface. A straight-through cable is used.

**Table A-2. Management Port Pinouts**

| Signal | Pin |
|---|---|
| Transmitted Data + | 1 |
| Transmitted Data – | 2 |
| Received Data + | 3 |
| Unused | 4 |
| Unused | 5 |
| Received Data – | 6 |
| Unused | 7 |
| Unused | 8 |




# Console Port Connector

The CONSOLE port connector is a DB9 socket connector that supports an EIA-232 circuit as shown in Table A-3.

**Table A-3. Console Port Connector**

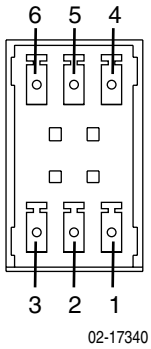
| RS-232 Signal | Direction | Pin |
|---|---|---|
| Data Carrier Detect | Out | 1 |
| Receive Data | Out | 2 |
| Send Data | In | 3 |
| Data Terminal Ready | In | 4 |
| Ground | — | 5 |
| Data Set Ready | Out | 6 |
| Request to Send | In | 7 |
| Clear to Send | In | 8 |
| Ring Indicator | — | 9 |

# Model 4210 ALARM/BITS Connector

The alarm relay reports major alarms through the ALARM connector (top row of contacts on the ALARM/BITS terminal block) on the front panel of the GranDSLAM Model 4210. The BITS connector (bottom row of contacts, pins 1–3) is for future use.

**Table A-4. Model 4210 ALARM/BITS Connector Pinouts**

| Signal | Direction | Pin |
|---|---|---|
| BITS Tip | In | 1 |
| BITS Ring | In | 2 |
| BITS Shield | Ground | 3 |
| Major Alarm | Out | 4 |
| Common | Out | 5 |
| Minor Alarm | Out | 6 |

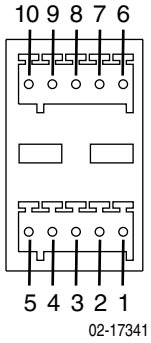



# Models 4220/4230 ALARM/BITS Connector

The alarm relay reports major alarms through the ALARM connector (top row of contacts on the ALARM/BITS terminal block) on the front panel of the GranDSLAM Models 4220 and 4230. The BITS connector (bottom row of contacts, pins 1–5) is for future use.

**Table A-5. Models 4220/4230 ALARM/BITS Connector Pinouts**

| Signal | Direction | Pin |
|---|---|---|
| BITS Tip | In | 1 |
| BITS Ring | In | 2 |
| BITS Shield | Ground | 3 |
| — | — | 4 |
| — | — | 5 |
| Major Alarm | Out | 6 |
| Common | Out | 7 |
| Minor Alarm | Out | 8 |
| Alarm Sense + | In | 9 |
| Alarm Sense – | In | 10 |



# 4201 T1 Uplink Module Connector

The 4201 T1 Uplink Module 100Ω connector is a single, RJ48C, unkeyed, shielded, 8-pin modular jack. The shield is connected to ground via the module. Pin assignments for the 100Ω connector are shown in Table A-6.

**Table A-6. 4201 T1 Uplink Module 100Ω Connector**

| Signal | Direction | Pin |
|---|---|---|
| Receive Ring | In | 1 |
| Receive Tip | In | 2 |
| NC | — | 3 |
| Transmit Ring | Out | 4 |
| Transmit Tip | Out | 5 |
| NC | In | 6 |
| NC | — | 7 |
| NC | — | 8 |

# 4202 E1 Uplink Module Connectors

The 4202 E1 Uplink Module has two types of connectors, only one of which may be used at a time:

- 120Ω Connector
- 75Ω Connector TX/RX Connectors

## 120Ω Connector

The 120Ω connector is a single, RJ48C, unkeyed, shielded, 8-pin modular jack. The shield is connected to ground via the module. Pin assignments for the 120Ω connector are shown in Table A-7.

**Table A-7. 4202 E1 Uplink Module 120Ω Connector**

| Signal | Direction | Pin |
|---|---|---|
| Receive Ring | In | 1 |
| Receive Tip | In | 2 |
| NC | — | 3 |
| Transmit Ring | Out | 4 |
| Transmit Tip | Out | 5 |
| NC | In | 6 |
| NC | — | 7 |
| NC | — | 8 |

## 75Ω TX/RX Connectors

The 75Ω TX/RX connectors each use coaxial cables that are unbalanced with respect to ground. The shield of the TX cable is connected directly to ground at the E1 module. The shield of the RX cable is capacitor-coupled to ground at the module. Pin assignments for the 75Ω TX/RX connectors are shown in Table A-8.

**Table A-8. 4202 E1 Uplink Module 75Ω TX/RX Connectors**

| Signal | Direction | Pin |
|---|---|---|
| Transmit | Out | Coax Center Conductor |
| Transmit Signal and Chassis Ground | — | Barrel |
| Receive | In | Coax Center Conductor |
| Receive return path (not grounded) | Out | Barrel |

# 4203 T1/E1 IMA Uplink Module Port Connectors

The 4203 T1/E1 IMA Uplink Module port connectors consist of eight RJ48C, unkeyed, shielded, 8-pin modular jacks. The shield is connected to ground via the module. Pin assignments for the T1 (100Ω impedance)/E1 (120Ω impedance) port connectors (1–8) are shown in Table A-9.

**Table A-9. 4203 T1/E1 IMA Uplink Module T1/E1 Port Connectors**

| Signal | Direction | Pin |
|---|---|---|
| Receive Ring | In | 1 |
| Receive Tip | In | 2 |
| NC | — | 3 |
| Transmit Ring | Out | 4 |
| Transmit Tip | Out | 5 |
| NC | In | 6 |
| NC | — | 7 |
| NC | — | 8 |

# Equipment List

# B

**Table B-1. GranDSLAM 4200 Equipment List (1 of 4)**

| Description | Model Number |
|---|---|
| GranDSLAM 4200 (24-Port) ReachDSL with 4201 T1 Uplink Module, without POTS Splitter, with U.S. defaults<br>*Includes GranDSLAM 4200, 19- and 23-inch mounting brackets and hardware, and Installation Guide.* | 4211-A1-520 |
| GranDSLAM 4200 (24-Port) ReachDSL with 4201 T1 Uplink Module, without POTS Splitter, with Japan defaults<br>*Includes GranDSLAM 4200, 19- and 23-inch mounting brackets and hardware, and Installation Guide.* | 4211-A1-523 |
| GranDSLAM 4200 (24-Port) ReachDSL with 4201 T1 Uplink Module, with POTS Splitter, with U.S. defaults<br>*Includes GranDSLAM 4200, 19- and 23-inch mounting brackets and hardware, and Installation Guide.* | 4211-A1-530 |
| GranDSLAM 4200 (24-Port) ReachDSL with 4201 T1 Uplink Module, with POTS Splitter, with Japan defaults<br>*Includes GranDSLAM 4200, 19- and 23-inch mounting brackets and hardware, and Installation Guide.* | 4211-A1-533 |
| GranDSLAM 4200 (24-Port) ReachDSL with 4202 E1 Uplink Module, without POTS Splitter, with EMEA defaults<br>*Includes GranDSLAM 4200, 19- and 23-inch mounting brackets and hardware, and Installation Guide.* | 4212-A1-522 |
| GranDSLAM 4200 (24-Port) ReachDSL with 4202 E1 Uplink Module, with POTS Splitter, with EMEA defaults<br>*Includes GranDSLAM 4200, 19- and 23-inch mounting brackets and hardware, and Installation Guide.* | 4212-A1-532 |
| GranDSLAM 4200 (24-Port) ReachDSL with 4203 T1/E1 IMA Uplink Module, without POTS Splitter, with U.S. defaults<br>*Includes GranDSLAM 4200, 19- and 23-inch mounting brackets and hardware, and Installation Guide.* | 4213-A1-520 |

**Table B-1. GranDSLAM 4200 Equipment List (2 of 4)**

| Description | Model Number |
|---|---|
| GranDSLAM 4200 (24-Port) ReachDSL with 4203 T1/E1 IMA Uplink Module, without POTS Splitter, with EMEA defaults<br>*Includes GranDSLAM 4200, 19- and 23-inch mounting brackets and hardware, and Installation Guide.* | 4213-A1-522 |
| GranDSLAM 4200 (24-Port) ReachDSL with 4203 T1/E1 IMA Uplink Module, with POTS Splitter, with Japan defaults<br>*Includes GranDSLAM 4200, 19- and 23-inch mounting brackets and hardware, and Installation Guide.* | 4213-A1-523 |
| GranDSLAM 4200 (24-Port) ReachDSL with 4203 T1/E1 IMA Uplink Module, with POTS Splitter, with U.S. defaults<br>*Includes GranDSLAM 4200, 19- and 23-inch mounting brackets and hardware, and Installation Guide.* | 4213-A1-530 |
| GranDSLAM 4200 (24-Port) ReachDSL with 4203 T1/E1 Uplink Module, with POTS Splitter, with EMEA defaults<br>*Includes GranDSLAM 4200, 19- and 23-inch mounting brackets and hardware, and Installation Guide.* | 4213-A1-532 |
| GranDSLAM 4200 (24-Port) ReachDSL with 4203 T1/E1 IMA Uplink Module, with POTS Splitter, with Japan defaults<br>*Includes GranDSLAM 4200, 19- and 23-inch mounting brackets and hardware, and Installation Guide.* | 4213-A1-533 |
| GranDSLAM 4200 (24-Port) ADSL without Uplink Module, without POTS Splitter, with U.S. defaults<br>*Includes GranDSLAM 4200, 19- and 23-inch mounting brackets and hardware, and Installation Guide.* | 4220-A1-520 |
| GranDSLAM 4200 (24-Port) ADSL without Uplink Module, without POTS Splitter, with EMEA defaults<br>*Includes GranDSLAM 4200, 19- and 23-inch mounting brackets and hardware, and Installation Guide.* | 4220-A1-522 |
| GranDSLAM 4200 (24-Port) ADSL without Uplink Module, without POTS Splitter, with Japan defaults<br>*Includes GranDSLAM 4200, 19- and 23-inch mounting brackets and hardware, and Installation Guide.* | 4220-A1-523 |
| GranDSLAM 4200 (24-Port) ADSL without Uplink Module, with POTS Splitter, with U.S. defaults<br>*Includes GranDSLAM 4200, 19- and 23-inch mounting brackets and hardware, and Installation Guide.* | 4220-A1-530 |
| GranDSLAM 4200 (24-Port) ADSL without Uplink Module, with POTS Splitter, with EMEA defaults<br>*Includes GranDSLAM 4200, 19- and 23-inch mounting brackets and hardware, and Installation Guide.* | 4220-A1-532 |

**Table B-1. GranDSLAM 4200 Equipment List (3 of 4)**

| Description | Model Number |
|---|---|
| GranDSLAM 4200 (24-Port) ADSL without Uplink Module, with POTS Splitter, with Japan defaults<br>*Includes GranDSLAM 4200, 19- and 23-inch mounting brackets and hardware, and Installation Guide.* | 4220-A1-533 |
| GranDSLAM 4200 (24-Port) ADSL with 4201 T1 Uplink Module, without POTS Splitter, with U.S. defaults<br>*Includes GranDSLAM 4200, 19- and 23-inch mounting brackets and hardware, and Installation Guide.* | 4221-A1-520 |
| GranDSLAM 4200 (24-Port) ADSL with 4201 T1 Uplink Module, without POTS Splitter, with Japan defaults<br>*Includes GranDSLAM 4200, 19- and 23-inch mounting brackets and hardware, and Installation Guide.* | 4221-A1-523 |
| GranDSLAM 4200 (24-Port) ADSL with 4201 T1 Uplink Module, with POTS Splitter, with U.S. defaults<br>*Includes GranDSLAM 4200, 19- and 23-inch mounting brackets and hardware, and Installation Guide.* | 4221-A1-530 |
| GranDSLAM 4200 (24-Port) ADSL with 4201 T1 Uplink Module, with POTS Splitter, with Japan defaults<br>*Includes GranDSLAM 4200, 19- and 23-inch mounting brackets and hardware, and Installation Guide.* | 4221-A1-533 |
| GranDSLAM 4200 (24-Port) ADSL with 4202 E1 Uplink Module, without POTS Splitter, with EMEA defaults<br>*Includes GranDSLAM 4200, 19- and 23-inch mounting brackets and hardware, and Installation Guide.* | 4222-A1-522 |
| GranDSLAM 4200 (24-Port) ADSL with 4202 E1 Uplink Module, with POTS Splitter, with EMEA defaults<br>*Includes GranDSLAM 4200, 19- and 23-inch mounting brackets and hardware, and Installation Guide.* | 4222-A1-532 |
| GranDSLAM 4200 (24-Port) ADSL with 4203 T1/E1 IMA Uplink Module, without POTS Splitter, with U.S. defaults<br>*Includes GranDSLAM 4200, 19- and 23-inch mounting brackets and hardware, and Installation Guide.* | 4223-A1-520 |
| GranDSLAM 4200 (24-Port) ADSL with 4203 T1/E1 IMA Uplink Module, without POTS Splitter, with EMEA defaults<br>*Includes GranDSLAM 4200, 19- and 23-inch mounting brackets and hardware, and Installation Guide.* | 4223-A1-522 |
| GranDSLAM 4200 (24-Port) ADSL with 4203 T1/E1 IMA Uplink Module, without POTS Splitter, with Japan defaults<br>*Includes GranDSLAM 4200, 19- and 23-inch mounting brackets and hardware, and Installation Guide.* | 4223-A1-523 |

**Table B-1. GranDSLAM 4200 Equipment List (4 of 4)**

| Description | Model Number |
|---|---|
| GranDSLAM 4200 (24-Port) ADSL with 4203 T1/E1 IMA Uplink Module, with POTS Splitter, with U.S. defaults<br>*Includes GranDSLAM 4200, 19- and 23-inch mounting brackets and hardware, and Installation Guide.* | 4223-A1-530 |
| GranDSLAM 4200 (24-Port) ADSL with 4203 T1/E1 IMA Uplink Module, with POTS Splitter, with EMEA defaults<br>*Includes GranDSLAM 4200, 19- and 23-inch mounting brackets and hardware, and Installation Guide.* | 4223-A1-532 |
| GranDSLAM 4200 (24-Port) ADSL with 4203 T1/E1 IMA Uplink Module, with POTS Splitter, with Japan defaults<br>*Includes GranDSLAM 4200, 19- and 23-inch mounting brackets and hardware, and Installation Guide.* | 4223-A1-533 |
| GranDSLAM 4200 (24-Port) ADSL without Uplink Module, without ISDN Splitter, with EMEA defaults<br>*Includes GranDSLAM 4200, 19- and 23-inch mounting brackets and hardware, and Installation Guide.* | 4230-A1-522 |
| GranDSLAM 4200 (24-Port) ADSL with 4202 E1 Uplink Module, without ISDN Splitter, with EMEA defaults<br>*Includes GranDSLAM 4200, 19- and 23-inch mounting brackets and hardware, and Installation Guide.* | 4232-A1-522 |
| GranDSLAM 4200 (24-Port) ADSL with 4203 T1/E1 IMA Uplink Module, without ISDN Splitter, with EMEA defaults<br>*Includes GranDSLAM 4200, 19- and 23-inch mounting brackets and hardware, and Installation Guide.* | 4233-A1-522 |
| 4201 T1 Uplink Module<br>*Includes Installation Instructions.* | 4201-B1-000 |
| 4202 E1 Uplink Module<br>*Includes Installation Instructions.* | 4202-B1-000 |
| 4203 T1/E1 IMA Uplink Module<br>*Includes Installation Instructions.* | 4203-B1-000 |
| GranDSLAM 4200 ATM Stackable DSLAM User's Guide (paper copy) | 4200-A2-GB20 |
| Mounting Brackets for ETSI 21-inch (535 mm) Rack | 4200-F1-001 |

# Technical Specifications

# C

Technical specifications are subject to change without notice.

**Table C-1. GranDSLAM 4200 Technical Specifications (1 of 2)**

| Specifications | Criteria |
|---|---|
| Cooling and Air Handling | Each GranDSLAM 4200 is independently cooled with integral fans and does not rely on vertical air flow. |
| Electromagnetic Compatibility (EMC) | Meets the following standards:<br>■ CISPR 22, Class A<br>■ EN 300 386-2<br>■ EN 55024<br>■ EN 55022<br>■ FCC Part 15, Class A<br>■ VCCI Class A |
| DSL Compatibility | The GranDSLAM 4200 supports:<br>■ ReachDSL 2.2 (Model 4210)<br>■ ADSL (Models 4220/4230)<br>■ G.lite (G.992.1)<br>■ ANSI T1.413-1998 |
| NEBS | The GranDSLAM 4200 is Network Equipment-Building System (NEBS) certified. |

**Table C-1. GranDSLAM 4200 Technical Specifications (2 of 2)**

| Specifications | Criteria |
|---|---|
| Interfaces | *GranDSLAM 4200:*<br>■ **DSL PORTS:** 50-pin RJ21X Telco-type connector<br>■ **POTS:** 50-pin RJ21X Telco-type connector<br>■ **CONSOLE:**<br>– 8-pin modular jack (10/100/1000BaseT)<br>– Small Form-factor Pluggable (SFP) socket (1000BaseX)<br>■ **MGMT:** 8-pin modular jack (10/100BaseT)<br><br>*4201 T1 Uplink Module:*<br>■ **100Ω:** RJ48C connector<br><br>*4202 E1 Uplink Module:*<br>■ **TX/RX 75Ω:** BNC connector<br>■ **120Ω:** RJ48C connector<br><br>*4203 T1/E1 IMA Uplink Module:*<br>■ **1**–**8** RJ48C connectors<br>– T1: 100Ω impedance<br>– E1: 120Ω impedance |
| Operating Environment | Ambient Temperature: –40° to 65° C (–40° to 149° F)<br>Relative Humidity: 5% to 95% noncondensing<br>Storage Temperature: –40° to 85° C (–40° to 185° F)<br>Shock and vibration tolerance sufficient to withstand normal shipping |
| Physical Dimensions | Height: 1.75″ (44.5 mm, or 1U as defined in EIA-310-C) without feet<br>Width: 17.2″ (436.9 mm) without mounting brackets<br>Depth: 11.8″ (299.7 mm)<br>Weight: 8.5 lb (3.86 kg) |
| Power | The unit operates from a standard CO –48 VDC power supply (–40.5 to –57.0 VDC). Dual feeds are supported. The terminal block accepts 28 to 18 AWG bare wire. The unit has two replacable, external fuses with a visual spring indicator and an alarm in case the fuse is blown. |
| Power Consumption | *Model 4210:*<br>■ –48 VDC, 3.5 Amps maximum sustained overcurrent protection, 30 Watts typical, 32 Watts maximum<br><br>*Models 4220/4230:*<br>■ –48 VDC, 4 Amps maximum sustained overcurrent protection, 48 Watts typical, 53 Watts maximum |

# Index

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